

**Notice of Allowability**

Application No.

10/743,714

Examiner

David N. Werner

Applicant(s)

KIM ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to communications filed 16 August 2007.
2. ☒ The allowed claim(s) is/are 1-3,5 and 6.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some\* c) ☐ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

### **DETAILED ACTION**

1. This Office action for US Patent Application 10/743,714 is in response to communications filed 16 August 2007, in reply to the Office action of 18 May 2007. Currently, claims 1-6 are pending. In the previous Office action, claim 3 was rejected under 35 U.S.C. 112, second paragraph as omitting structural cooperative relationships of claimed elements, claims 4-6 were rejected under 35 U.S.C. 112, second paragraph as lacking antecedent basis for claim limitations, claim 1 was rejected under 35 U.S.C. 103(a) as obvious over US Patent 6,108,040 A (Moteki et al.) in combination with US Patent 6,282,243 B1 (Kazui et al.) and US Patent 6,380,986 B1 (Minami et al.), claims 2 and 3 were rejected under 35 U.S.C. 103(a) as obvious over Moteki et al., Kazui et al., Minami et al., and US Patent Application Publication 2004/0141554 A1 (Phong et al.), and claim 6 was rejected under 35 U.S.C. 103(a) as obvious over Moteki et al., Kazui et al., Minami et al., and US Patent 6,813,351 B1 (Auyeung et al.). The drawings, abstract, specification, and claims were objected to on formalities. Claims 4 and 5 were indicated as having allowable subject matter.

### ***Information Disclosure Statement***

2. Receipt of the translation of Korean Publication 2000-55899 is acknowledged.

***Drawings***

3. Replacement drawing sheets were received on 16 August 2007. These drawings are acceptable.

***Examiner's Amendment***

4. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Yoon S. Ham on 06 November 2007.

The application has been amended as follows:

Replace claim 1 with:

A method of detecting motion in a mobile device, the method comprising the steps of:

(a) obtaining horizontal and vertical number of macro blocks of a frame and initializing horizontal and vertical sizes of the macro block;

(b) moving a predetermined amount of data in a column of the frame to a predetermined number of block buffers of an internal memory;

(c) performing motion detection on the data stored in the block buffers and incrementing the vertical number of the macro blocks;

(d) ascertaining whether the motion detection is completed on the block buffers in a vertical direction, and if the motion detection is completed on the blocks in the vertical direction, initializing the vertical size of the macro block and incrementing the location of the block buffers in a horizontal direction, moving a predetermined amount of macro block data to a block location making the block buffers form a circular buffer if the motion detection is not completed in the vertical direction, and performing a modulo division operation to form the circular buffer; determining buffer addresses with remaining values; determining similarity according to each block location on the circular buffer to obtain a sum of absolute difference (SAD) value; and

(e) ascertaining whether the motion detection is completed on the block buffers in a horizontal direction, and if the motion detection is not completed on the blocks in the horizontal direction, and if the motion detection is not completed on the blocks in the horizontal direction, the method continues to step (b);

wherein a search range is  $(-16, 15)$ , inclusive,

and the data is arranged in a  $48 \times 16$  array in a vertical direction and the data is arranged in a  $16 \times 48$  array in the horizontal direction so as to pack the data in blocks when moving the data.

Replace claim 2 with:

The method of claim 1, wherein in the step (d), if the motion detection is not completed in the vertical direction, a predetermined amount of macro block data is moved to a block location obtained by a modulo division operation.

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Replace claim 3 with:

The method of claim 2, wherein the modulo division operation used to determine the block location is equal to:  $\{((\text{the vertical number of macro blocks}) + 2) \bmod 4\}$ , if there are three macroblocks.

Cancel claim 4.

Replace claim 5 with:

The method of claim 1, wherein a search range is  $(-8, 7)$ , inclusive, the data is arranged in a  $32 \times 16$  array in the vertical direction and the data is arranged in a  $16 \times 32$  array in the horizontal direction so as to pack the data in blocks when moving the data, the method further comprising;

determining a similarity according to  $(i, j)$  on the circular buffer to obtain a sum of absolute differences (SAD) value.

Replace claim 6 with:

The method of claim 1, wherein the motion estimation is performed when a search range is  $(-8, 7)$ , inclusive, so as to determine a size and an allocation of the circular buffer for a search range  $(-16, 15)$ , inclusive.

***Allowable Subject Matter***

5. Claims 1-3, 5, and 6 are allowed.

6. The following is an examiner's statement of reasons for allowance: Subject matter previously indicated as allowable has been incorporated into the independent claim.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent 5,329,318 A (Keith) teaches a video processor with circular input and output buffers. "Predictive Line Search: An Efficient Motion Estimation Algorithm for MPEG-4 Encoding Systems on Multimedia Processors" (Huang et al.) teaches a motion vector prediction method with a (-16, 16) search range and a 16 x 48 horizontal pixel candidate array.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David N. Werner whose telephone number is (571) 272-9662. The examiner can normally be reached on Monday-Friday from 8:30 AM - 5:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on (571) 272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DNW

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